

Trend Study 10-13-00

Study site name: Moon Ridge Burn .

Range type: Burned Black Greasewood .

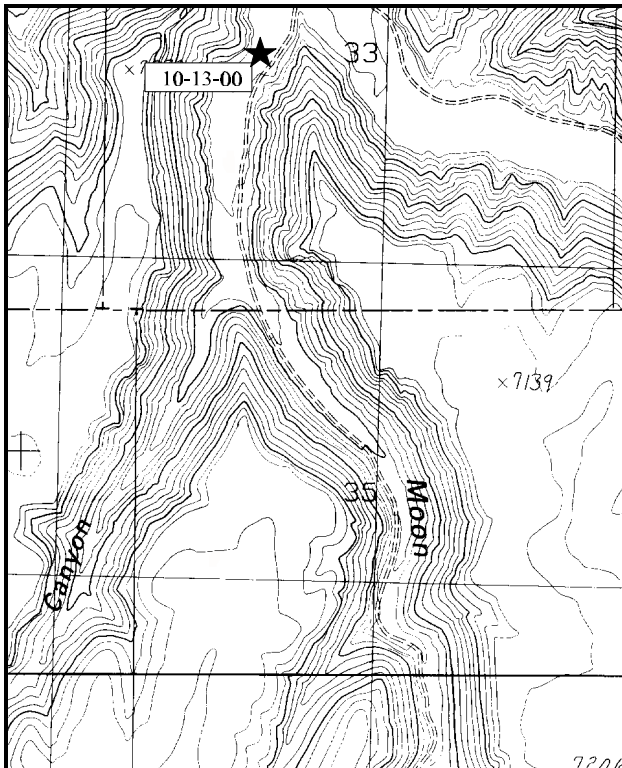
Compass bearing: frequency baseline 2°M degrees.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

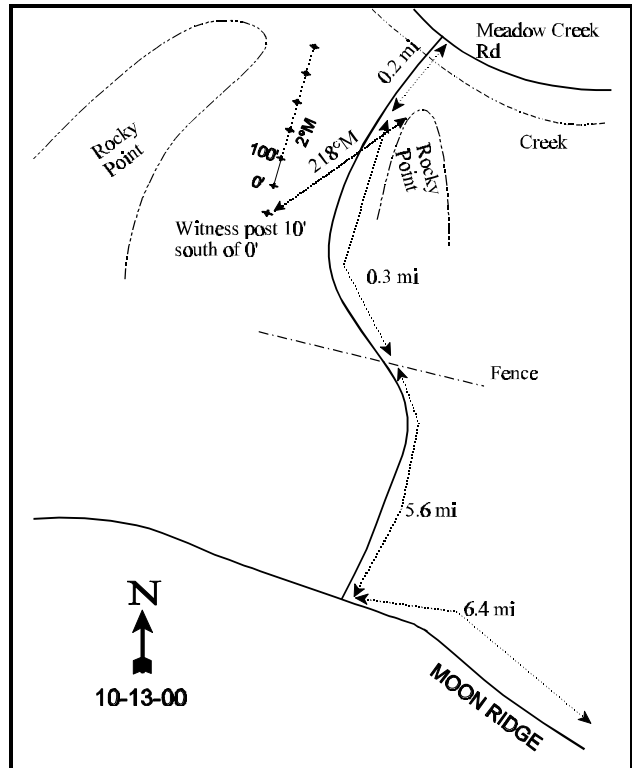
Travel 6.4 miles up Moon Ridge to Moon Ridge Canyon. Turn right and travel north down Moon Ridge canyon 5.6 miles to a gate. From the gate travel 0.3 miles and stop. From here walk towards the wash and into the burn to a full high witness post. The 0 ft. baseline stake is 10 feet to the north. The baseline runs north at 2/M.

When coming from Winter Ridge to the north travel to the intersection of Moon Canyon and Meadow Creek. Cross Meadow Creek and travel south 0.2 miles and stop. From here walk towards the wash and into the burn to a full high witness post. The 0 ft. baseline stake is 10 feet to the north.



Map Name: Tenmile Canyon North .

Township 15S , Range 21E , Section 33



Diagrammatic Sketch

UTM. 4369728.387 N, 622625.958 E

DISCUSSION

Trend Study No. 10-13 (16A-13)

The Moon Ridge Burn site was established in 1995 to monitor a burn and herbicide treatment of a greasewood dominated draw in Ten Mile Canyon. The area is administered by the Division of Wildlife Resources. It was burned in 1994, then later sprayed as the greasewood resprouted. This treatment was done to enhance habitat for wintering elk in the area. This site was re-read in 1997 as a special studies site to address perceived conflicts over elk and livestock use in the North Book Cliffs. In 1997, pellet group data estimated 59 elk days use/acre (146 edu/ha) and 19 cow days use/acre (47 cdu/ha). Pellet group transect data from 2000 estimate 1 deer day use/acre (2 ddu/ha), 22 elk days use/acre (54 edu/ha), and 13 cow days use/acre (32 cdu/ha). Due to several mild winters since 1997, it appears that winter elk use has decreased since the 1997 reading.

Terrain at the site is a nearly level canyon bottom. Soils are moderately deep and alluvially deposited. Texture analysis indicates a sandy loam soil with very little surface rock and pavement cover. Soils are slightly alkaline (pH of 7.8). The effective rooting depth was estimated to be 22 inches with an average temperature of 61°F. In the middle of the transect, the soil becomes more shallow with significantly more rock in the profile, but the soil on both ends is deeper with little rock encountered. There is abundant organic matter in the soil, mostly from old roots, presumably from the dense stand of black greasewood the once dominated this site. Since 1995, percent bare ground has considerably decreased from 49% to just over 22% in 1997, and to only 11% in 2000. Erosion still does not appear to be serious problem at this time, due to the level terrain, abundant herbaceous vegetation, and well dispersed litter cover.

Browse was not abundant on the site following the treatment, but has increased for some species since 1995. Fringed sagebrush had an estimated density of 1,200 plants/acre in 1997, increasing to 4,760 plants/acre in 2000. Most of the population was classified as mature in 1997. Age class distribution in 2000 shows a large influx of young plants where present, with young plants making up 80% of the population. Seedlings are also extremely abundant being estimated at 4,820 seedlings/acre in 2000. Basin big sagebrush density is slowly increasing from an estimated 140 plants/acre in 1997 to 200 plants/acre in 2000. These plants showed no utilization and were all classified as young in 1997. Many of these young plants have persisted and matured as 90% of the population is now classified as mature. Use is mostly light and vigor generally good except on 10% of the population.

Black greasewood is the dominant shrub on the site. Following the burn and spray treatment, greasewood has steadily increased from 640 plants/acre in 1995, to 960 plants/acre in 1997, and 1,740 plants/acre in 2000. Cover has doubled since 1997 from 7% to 15%. Currently, young recruitment is high at 36% indicating an increasing population in the future. A follow-up treatment is needed before greasewood becomes too dominant. Greasewood currently provides 94% of the browse cover and 21% of the total vegetative cover at this site.

Small numbers of rubber rabbitbrush, and seeded prostate kochia were encountered on the site in 1995. In 1997, rubber rabbitbrush density declined, but slightly increased in 2000 to 100 plant/acre. Prostrate kochia was not sampled in either 1997 or 2000.

Herbaceous vegetation is abundant, especially annual forbs. By far the dominant herbaceous species is summer cypress which currently has a cover value of 39%. It makes up 71% of the herbaceous cover and 55% of the total vegetative cover. Perennial grasses are composed almost entirely of seeded species including: crested wheatgrass, smooth brome, basin wildrye, and intermediate wheatgrass. Native perennial grasses are present in low numbers and include: thickspike wheatgrass and sand dropseed. Cheatgrass is present, but not particularly abundant. All grasses combined provide about 13% average cover.

1995 APPARENT TREND ASSESSMENT

The soil appears stable even though bare ground is abundant. The level terrain, well distributed litter cover (22%), and the abundant herbaceous vegetation cover (29%) prohibit serious erosion at this time. Browse is limited due to the treatment, yet a few seedlings and young fringed sagebrush, big sagebrush, and rubber rabbitbrush were encountered along with some seeded prostate kochia. The only negative aspect of the browse trend is the presence of resprouting greasewood. They are not currently abundant, however they will most likely increase in the future. The herbaceous understory is dominated by early successional forbs. The native and seeded grasses should increase and eventually dominate the site.

1997 TREND ASSESSMENT

Soil trend is improving with a decrease in bare ground cover and an increase in vegetation and litter cover. There is no erosion apparent on the site at this time. Soil trend is slightly upward. Black greasewood density has increased and the plants continue to become robust. Percent kill of greasewood on the north end of the transect was more complete than on the south end. Data collected in 1997 indicates that not only has the black greasewood density increased to 960 plants/acre, but these plants have become very robust averaging 41 inches in height with crown measurements of 58 inches. About 25% of the population are producing flowers 3 years after the burning and herbicide treatment. Black greasewood appears to be re-establishing on the site. Many of the black greasewood plants are sprouting from burned stumps. Fringed sagebrush has also increased in density, with a mostly mature age structure. Browse trend is stable at this time, but the black greasewood should have additional treatments to further reduce the density before the site is again dominated. Seeded grass cover and nested frequency have increased since 1995. Great Basin wildrye provides 7% of the herbaceous cover, while crested wheatgrass has increased to provide 13% of the herbaceous cover. Smooth brome, although encountered in 1995, was not sampled in 1997. Grasses now provide 22% of the total vegetative cover compared to 18% in 1995. Cheatgrass was encountered in 1997, although it has a cover value of less than 1%. All but two of the forbs are annual increasers. Dominant forb species are still early successional annuals and short lived perennials; summer cypress, Fremont goosefoot, tansymustard, coyote tobacco, and Russian thistle. Only one seeded forb, alfalfa, was sampled in 1997. Small burnet, sampled in 1995, but in low abundance, was not found in 1997. The herbaceous trend is stable.

TREND ASSESSMENT

soil - slightly upward (4)

browse - stable, black greasewood population should continue to be monitored for possible future treatment (3)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is up. Vegetation and litter cover continue to increase, while bare ground continues to decrease. Trend for browse is down as black greasewood dominates the shrub component. Greasewood currently makes up 94% of the browse cover and nearly doubled in density in 2000. Greasewood recruitment is high at 36% and average height and crown measurements have increased every year since the treatment. Trend for the herbaceous understory is down due to the dominance of annuals, primarily summer cypress which makes up 71% of the herbaceous cover, and 55% of the total cover. Sum of nested frequency for perennial species decreased in 2000 as well.

TREND ASSESSMENT

soil - up (5)

browse - down due to the dominance of greasewood (1)

herbaceous understory - down and dominated by annual species (1)

HERBACEOUS TRENDS --
Herd unit 10 , Study no: 13

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %		
		'95	'97	'00	'95	'97	'00	'95	'97	'00
G	Agropyron cristatum	_a 88	_b 221	_b 201	35	74	67	1.41	7.12	7.55
G	Agropyron dasystachyum	_a 1	_a -	_b 35	1	-	15	.03	-	1.41
G	Agropyron intermedium	-	-	8	-	-	2	-	-	.66
G	Agropyron repens	_b 32	_c 61	_a -	12	25	-	.91	.80	-
G	Bromus inermis	_c 39	_a -	_b 14	15	-	5	1.00	-	.15
G	Bromus tectorum (a)	_a -	_b 35	_b 57	-	13	20	-	.45	.94
G	Elymus cinereus	37	46	22	19	19	10	2.26	3.59	1.88
G	Poa pratensis	-	-	2	-	-	1	-	-	.15
G	Sporobolus cryptandrus	-	-	1	-	-	1	-	-	.00
Total for Annual Grasses		0	35	57	0	13	20	0	0.45	0.94
Total for Perennial Grasses		197	328	283	82	118	101	5.63	11.53	11.81
Total for Grasses		197	363	340	82	131	121	5.63	11.98	12.75
F	Chenopodium fremontii (a)	_c 339	_b 109	_a 8	95	34	4	18.03	3.01	.07
F	Chorispora tenella (a)	2	2	-	1	2	-	.03	.06	-
F	Descurainia pinnata (a)	_b 82	_c 256	_a 7	41	80	3	2.94	7.09	.01
F	Kochia scoparia (a)	_a 14	_b 374	_c 427	9	94	96	.52	18.73	38.93
F	Lappula occidentalis (a)	_a 17	_b 99	_b 75	8	33	29	.29	3.77	3.31
F	Medicago sativa	_b 33	_a 3	_a -	14	3	-	.24	.07	-
F	Nicotiana attenuata (a)	_b 14	_a -	_a -	5	-	-	.12	-	-
F	Salsola iberica (a)	5	-	-	3	-	-	.21	-	-
F	Sanguisorba minor	_b 17	_a -	_a -	7	-	-	.06	-	-
F	Taraxacum officinale	-	1	-	-	1	-	-	.00	-
F	Unknown forb-annual (a)	5	-	-	1	-	-	.15	-	-
F	Wyethia amplexicaulis	_b 20	_a -	_a -	9	-	-	.31	-	-
Total for Annual Forbs		478	840	517	163	243	132	22.31	32.68	42.33
Total for Perennial Forbs		70	4	0	30	4	0	0.62	0.07	0
Total for Forbs		548	844	517	193	247	132	22.93	32.75	42.33

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 10 , Study no: 13

Type	Species	Strip Frequency			Average Cover %		
		'95	'97	'00	'95	'97	'00
B	Artemisia frigida	10	27	26	.18	1.35	-
B	Artemisia tridentata tridentata	1	6	8	.00	.21	.91
B	Chrysothamnus nauseosus	3	1	4	.02	.06	.03
B	Chrysothamnus viscidiflorus viscidiflorus	0	1	0	-	-	-
B	Kochia prostrata	5	0	0	.96	-	-
B	Sarcobatus vermiculatus	28	40	44	1.18	7.35	14.93
Total for Browse		47	75	82	2.35	8.98	15.87

BASIC COVER --

Herd unit 10 , Study no: 13

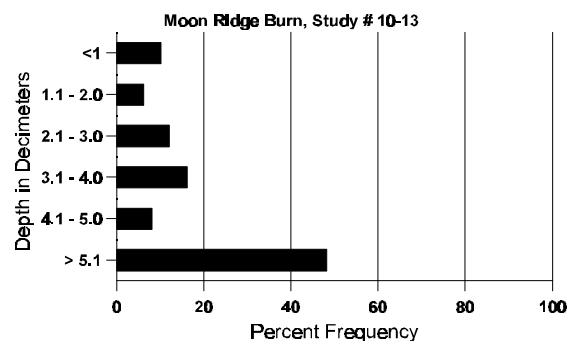
Cover Type	Nested Frequency			Average Cover %		
	'95	'97	'00	'95	'97	'00
Vegetation	382	479	479	31.79	51.60	63.93
Rock	25	25	4	.72	.36	.15
Pavement	9	64	13	.06	.37	.12
Litter	465	492	492	22.21	36.65	68.13
Cryptogams	5	67	17	.00	.44	.21
Bare Ground	454	312	208	49.30	22.56	10.91

SOIL ANALYSIS DATA --

Herd Unit 10, Study no: 13

Effective rooting depth (inches)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
22.1	61.2 (19.7)	7.8	51.0	28.8	20.2	4.9	25.4	502.4	4.3

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 10 , Study no: 13

Type	Quadray Frequency			Pellet Transect			
	'95	'97	'00	Pellet Groups per Acre		Days Use per Acre (ha)	
				'97	'00	'97	'00
Rabbit	-	-	7	-	35	-	N/A
Elk	1	25	20	766	287	59 (145)	22 (55)
Deer	-	-	-	-	9	-	1 (2)
Cattle	-	5	11	226	157	19 (47)	13 (33)

BROWSE CHARACTERISTICS --

Herd unit 10 , Study no: 13

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia frigida																		
S	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	241	-	-	-	-	-	-	-	-	241	-	-	-	4820		241	
Y	95	10	-	-	-	-	-	-	-	-	10	-	-	-	200		10	
	97	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
	00	190	1	-	-	-	-	-	-	-	191	-	-	-	3820		191	
M	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140	9	10	
	97	51	-	-	-	-	-	-	-	-	51	-	-	-	1020	12	14	
	00	42	-	-	-	-	-	3	-	-	45	-	-	-	900	5	7	
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+72%							
'97		00%			00%			00%			+75%							
'00		.42%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	340	Dec:	0%			
												'97	1200		0%			
												'00	4760		1%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata tridentata																		
Y	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	97	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	7	2	-	-	-	-	-	-	-	6	2	1	-	180	18	9	
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	140		7	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+86%							
'97		00%			00%			00%			+30%							
'00		20%			00%			10%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	20	Dec:	-			
												'97	140		-			
												'00	200		-			
Chrysothamnus nauseosus																		
Y	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	47	0	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	15	4	
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			-75%							
'97		00%			00%			00%			+80%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	80	Dec:	-			
												'97	20		-			
												'00	100		-			
Chrysothamnus viscidiflorus viscidiflorus																		
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'97		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	0	Dec:	-			
												'97	20		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Kochia prostrata																		
M	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100	11	9	5
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'97		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	100	Dec:	-			
												'97	0		-			
												'00	0		-			
Sarcobatus vermiculatus																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
Y	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
	97	35	-	-	-	-	-	-	-	-	35	-	-	-	700		35	
	00	31	-	-	-	-	-	-	-	-	31	-	-	-	620		31	
M	95	22	-	-	2	-	-	-	-	-	24	-	-	-	480	14	15	24
	97	12	-	-	-	-	-	-	-	-	12	-	-	-	240	41	58	12
	00	43	-	-	11	-	-	1	-	-	55	-	-	-	1100	51	54	55
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	3960			198
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	2200			110
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+33%							
'97		00%			00%			00%			+45%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	640	Dec:	0%			
												'97	960		2%			
												'00	1740		1%			